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**Pressurized Vapor Cycle Liquid Distillation****Abstract**

Embodiments of the invention are directed toward a novel pressurized vapor cycle for  
5 distilling liquids. In some embodiments of the invention, a liquid purification system is  
revealed, including the elements of an input for receiving untreated liquid, a vaporizer  
coupled to the input for transforming the liquid to vapor, a head chamber for collecting the  
vapor, a vapor pump with an internal drive shaft and an eccentric rotor with a rotatable  
housing for compressing vapor, and a condenser in communication with the vapor pump for  
10 transforming the compressed vapor into a distilled product. Other embodiments of the  
invention are directed toward heat management, and other process enhancements for making  
the system especially efficient.